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COMNAVAIRLANTINST 3530.3
NAVAIRPAC N63
NAVAIRLANT N81
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Subj: STANDARD OPERATING PROCEDURES FOR COMBAT DIRECTION CENTER (CDC) NAVIGATION AND SURFACE CONTACT MANAGEMENT

Ref: (a) OPNAVINST 3120.32C (SORM)

Encl: (1) Combat Direction Center (CDC) Navigation and Surface Contact Management Guidelines

1. Purpose. To provide standard operating procedures for CDC navigation and surface contact management for Commander Naval Air Force, U.S. Pacific Fleet (COMNAVAIRPAC) and Commander Naval Air Force, U.S. Atlantic Fleet (COMNAVAIRLANT) ships. This is a complete revision and should be reviewed in its entirety.

2. Cancellation. COMNAVAIRPACINST 3530.2A

3. Background. In order to provide timely and accurate support to the Navigator and Officer of the Deck as prescribed in reference (a), CV/CVN CDC personnel must master the skills and methods required to assist in safe navigation and maintain continuous situational awareness of the operating environment.

4. Action. Effective upon receipt, the guidelines contained in enclosure (1) shall be used to standardize, as much as possible, CDC navigation and surface contact management procedures and shall be included in required reading for CDC and Bridge watchstanders.

"Signed"
R. L. Leitzel
Chief of Staff

"Signed"
J. B. Singleton
Chief of Staff

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CDC Navigation and Surface Contact Management Guidelines

Ref: (a) COMNAVSURFLANT/COMNAVSURFPAC/COMNAVAIRPAC/COMNAVAIRLANTINST 3530.4 (SERIES) (NAV DEPT SORM)
(b) COMNAVAIRLANT/COMNAVSURFPACINST 3516.1 (CSTP)

COMBAT DIRECTION CENTER (CDC) NAVIGATION AND SURFACE CONTACT MANAGEMENT GUIDELINES

I. Introduction

a. This instruction is geared to provide base-line standard operating procedures (SOP) for CV/CVN CDC navigation and surface contact management. It is intended to supplement reference (a) which provides Navigation Department organization and regulations.

b. While organizational relationships, individual responsibilities, and CDC/TOP configuration within ships may differ, each ship's CDC Officer (CDCO) is responsible for the proper performance of the ship's CDC watch team. It is the CDCO's responsibility to apply standing orders and doctrine in order to provide the guidance and training necessary to ensure watch team members understand their individual duties and responsibilities.

c. The routine business of navigation and surface contact management is conducted between the Surface Watch Officer (SWO) and the Junior Officer of the Deck (JOOD) or Junior Officer of the Watch (JOOW). Each provides the other with pertinent information on navigation, shipping, and tactical communications in a system of checks and balances. Radar contact designations, maneuvering recommendations, Officer of the Deck (OOD) intentions, changes of course, speed, or maneuvering combinations must be understood, concurred with, and approved as appropriate by the SWO, CDC Watch Officer (CDCWO), Tactical Action Officer (TAO), and OOD. When a conflict arises anywhere within this chain of command, it is imperative that the problem be elevated to the level of the TAO, CDCWO, and OOD. If not resolved, the Commanding Officer must be notified of the conflict immediately to allow sufficient time to analyze the available information and take appropriate action prior to the situation deteriorating. The CDCO and Navigator should be immediately apprised of the situation so that their expertise is available to the Commanding Officer. It is a breakdown in this process of conflict resolution that has directly or indirectly contributed to CV/CVN navigational incidents. Watch supervisory personnel, SWOs, CDCWOs, TAOs, OODs must understand the process of conflict resolution and be encouraged to elevate the decision-making responsibility up the chain-of-command whenever conflicts cannot be quickly resolved at their level.

II. Organization and responsibilities

a. The CDC navigation and surface contact management organization supports the TAO/OOD/CDCWO in safely navigating and maintaining surface traffic situational awareness through a system of checks and balances as well as providing an independent, autonomous, backup for safe navigation during periods of reduced visibility and restricted maneuvering. The CDC navigation and surface contact management organization consist of the following:

(1) Surface Warfare Module (SUWM). SUWM (formerly ASUWM) responsibilities and manning will be per reference (b). While the SUWM's major surveillance responsibilities extend beyond 32 NM to surveillance limits, "total-picture" (from own ship to maximum sensor range) surveillance will be maintained at all times in order to provide track supervision and an extra set of eyes on the close-in tactical surface picture.

(2) Tactical Operations Plot (TOP). The TOP will be manned per reference (b) chapter 4 during Conditions I and III. CDC Piloting Team Duties will be conducted in TOP per reference (b) chapter 5. During normal steaming, the close-in (32 Nautical Miles to own-ship) tactical surface picture will be maintained in TOP. TOP Watchstanders are involved with navigation of the ship, maintaining the radar watch to detect close in, pop-up contacts, and correlation of radar contacts to shipping reported by the lookouts and other units.

b. To accomplish CDC's mission, SUWM and TOP personnel must be proficient in:

- surface track management
- tactical maneuvering
- operator manipulation of the Advanced Combat Direction System (ACDS)
- radar repeater operations
- radar navigation
- navigation chart plotting based on NAVAIDS
- maintaining the geographic plot on the Dead Reckoning Tracer (DRT)
- own ship and formation tactics
- tactical communications
- underway replenishment
- emergency procedures

c. Underway, the TAO (CDCWO, if TAO is not assigned) has overall responsibility for CDC navigation and surface contact management. The CDCWO provides administrative assistance to the SWO as required.

d. The SWO is directly responsible to the OOD for matters pertaining to the safe operation and navigation of the ship. Additionally, the SWO shall keep the TAO/CDCWO informed of all surface related matters during all underway evolutions including radar navigation, underway replenishment and normal steaming.

e. While the TAO/CDCWO are responsible for keeping the command informed of the evaluated tactical situation for the offensive and defensive fighting of the ship, the SWO is responsible for keeping the OOD as well as the TAO/CDCWO informed of the surface shipping situation. In urgent cases or when the safety of the ship and crew is in doubt, the SWO shall make recommendations directly to OOD who shall positively acknowledge the recommendation.

f. All officers standing watches in CDC/TOP shall be familiar with the duties and responsibilities of CDC/TOP and bridge watchstanders. Conversely, every bridge watchstander must know and understand the capabilities and limitations of CDC and the bridge. More importantly, these watchstanders must communicate constantly. Members of the OOD's team must be able to interpret the radar returns appearing on the bridge radar and radar repeaters, which can be used to verify CDC/TOP navigation information. The OOD must be familiar with the information required by CDC/TOP and shall keep the SWO, CDCWO and TAO informed of intended actions.

g. CDC/TOP and the bridge shall exchange information on all surface contacts, keeping the TAO/CDCWO informed, within a distance specified by standing orders (normally 20 nautical miles). The SUWM shall collect information on all surface/subsurface contacts as required, normally out to 300 miles from the formation. Surface status board information shall be made available continuously to the bridge via the JL/JS circuit as backup for ASTAB information and to provide bearing drift. Specific surface contact reporting procedures are contained in ship doctrines and standing orders.

h. The SWO shall assist the OOD by reporting the position of the guide periodically with recommendations for maintaining station. Tolerances for station keeping are contained in Battle Group doctrine or directed by the OOD. Any appreciable change in the relative position of a ship in the formation shall be reported to the OOD immediately.

i. Every maneuvering problem will be solved using both ACDS and a maneuvering board solution when feasible. Solutions obtained and a recommended course of action shall be logged, and relayed to the OOD by the SWO. Any danger of collision shall be reported immediately to the OOD and TAO with a recommended course of action.

j. The SWO/SUWM Supervisor shall maintain a record of communications traffic on all tactical nets in use. All tactical signals received shall be recorded, decoded, interpreted and relayed along with CDC's recommendation if appropriate, to the OOD for comparison with the bridge's interpretation for concurrence. Any signals received by flag hoist, flashing light, or "Nancy" shall be passed to the CDCWO and/or SWO by the OOD, as appropriate.

k. SUWM/TOP are responsible for maintenance of the following plots as a minimum:

(1) Geographic Plot (DRT)

(2) Maneuvering board

(3) Navigation chart

(4) Surface status board (on bridge)

(5) ACDS and associated ASTABS

(6) assigned radar/radar repeater(s)

l. In addition to the plots required above, the following records must be maintained by SUWM/TOP:

(1) Surface watch log

(2) Surface contact log

(3) Surface status board (in TOP)

(4) Radio telephone logs (as assigned)

m. In the event that plotting responsibilities shift between SUWM and TOP, extreme care must be taken to ensure that the tactical picture is maintained during the transition. Plots will be maintained in both locations until the SWO and SUWM Supervisor are comfortable with the accuracy and completeness of the navigation and surface traffic picture.

n. The SWO's responsibility to the OOD and the navigator rests with providing every assistance that can be afforded by electronic means to safely navigate the ship. Radar navigation shall be conducted at all times while transiting restricted waters. The preferred method of navigation in restricted waters is to combine visual and radar information. CDC/TOP shall have a radar navigation team manned when the ship is in restricted waters. The navigator will use CDC/TOP navigation plot as an independent piece of information to assist in determining the actual position of the ship. Extreme care must be taken by watchstanders to ensure that CDC/TOP's navigation plot maintains absolute autonomy.

o. At sea, the ship's position shall be maintained by using the navigator's fixes. Using the navigator's fix as a starting point, a DR will be maintained, as accurately as possible, and compared with GPS, ACDS and DRT positions. CDC's estimate of the ship's position will then be passed to the Quartermaster of the Watch (QMOW) who will in turn, use the estimate in determining the position of the ship. A navigation comparison log of these positions (QMOW and CDC/TOP) shall be kept half-hourly. The SWO shall maintain a navigational track at all times and report all landfalls and hazards to navigation to the OOD.

p. CDC/TOP will maintain and prepare its own set of navigation charts. When the charts are complete with the proposed track laid out, the CDC/TOP navigation track will be compared to the navigator's during each sortie and at such times as operations are being conducted in restricted or dangerous waters. Once compared, these charts shall be signed by the Commanding Officer.

q. The SWO shall assist the navigator and the OOD in anchoring and underway replenishment operations.

r. The SWO shall provide radar derived fixes or estimated positions to the navigator a minimum of every 15 minutes whenever land is displayed on any radar, and a radar navigation log of these positions shall be maintained.

III. Surface Contact Management

a. General. Surface contact management is one of SUWM and TOP's most important responsibilities. A vigilant, continuous search for surface contacts is required when underway in order for timely maneuvers to be taken by the OOD. Furthermore, during hostile engagements, early detection and accurate tracking of surface contacts is vital, and could well prove to be the decisive factor. Radar is the primary means of surface contact management; however, the SUWM and TOP watch team must be fully cognizant of other sources of assistance such as lookouts, C2W resources in the electronic warfare module, and SSES.

b. Normal Steaming

(1) When the carrier is operating at sea, all surface contacts within radar range (normally 20 NM) must be continuously tracked and reported. The following guidelines are established for proper contact management:

(a) The ACDS surface tracker will normally conduct the search, utilizing the 32 NM range scale so that course, speed, and Closest Point of Approach (CPA) can be developed on the track by the time it reaches 20 NM and reported to the OOD.

(b) The radar repeater surface tracker will set the scope on a 20 NM range scale.

(c) All contacts inside 20 NM will be tracked on ACDS, maneuvering board (when feasible), and the DRT to accurately determine course, speed and CPA.

(d) Upon initial detection, the contact will be reported to the bridge in a standard format and may include ACDS course, speed and CPA information according to standing orders or doctrine. This information will be displayed on the surface status boards, and other plots in CDC/TOP and on the bridge. The information will also be kept in the Surface Radar Contact Log (SRCL).

(e) Initial ACDS information should be followed by a refined maneuvering board or DRT solution as soon as possible (nine minutes is a typical interval).

(f) If unable to determine accurate course and speed due to slow movement, the contact will be reported as "tracking erratically."

(g) Contacts tracked on ACDS and DRT with no discernable movement, may be reported as Dead In Water (DIW).

(h) All contacts with CPAs of 20,000 yards or less will be tracked and reported at intervals of three minutes.

(i) Contacts inside of 10,000 yards that have CPAs of 5,000 yards or less may be tracked and reported at one minute intervals at the discretion of either the OOD, SWO or TAO/CDCWO. All other contacts will be reported at intervals of three to six minutes intervals, depending on the contact density. Constant Bearing Decreasing Range (CBDR) contacts shall be reported by the SWO to the OOD, TAO, and CDCWO (and a positive acknowledgement obtained).

(j) Any change in contacts CPA, course changes of more than five degrees, or speed changes of more than three knots will be reported to the bridge.

(k) As directed by the OOD, a "watch" may be assigned contacts with CPAs beyond 10,000 yards. CDC/TOP will continue tracking contacts assigned a "watch" until a "scrub" is directed. As an example; a "watch" on a contact past CPA and beyond 10,000 yards would be appropriate when the CV/CVN is in a modloc situation turning in and out of the wind and continually having the same surface contact appear.

(2) Contacts will be "scrubbed" only by the OOD when they are no longer considered tactically significant.

(3) An avoiding course solution will be calculated and recommended to the bridge for all contacts having a CPA of 10,000 yards or less. All such recommendations must be in strict compliance with the rules of the road. If maneuvering restrictions will not permit a 10,000 yard CPA, a recommendation for a course permitting CPA per commanding officer's standing orders will be made.

(4) Maintaining an up-to-the-minute tactical plot of units in company with the CV/CVN is a vital part of surface contact management. Continuous tracking of these units is not required while they are in assigned stations. If relative movement indicates they are leaving their assigned stations, these units are to be tracked continuously like any other surface contact until regaining their assigned station.

(5) When operating under Emission Control (EMCON) conditions, SUWM and TOP must coordinate with the EW module and the lookouts to aid in maintaining their tactical surface plot. All SUWM and TOP watch team members must be familiar with proper procedures for tracking contacts utilizing "bearings only" which the EW module and lookouts can provide. Assigning qualified personnel from CDC/TOP to augment the lookouts during EMCON operations will also aid in maintaining the tactical picture in CDC/TOP.

(6) When operating in a Battle Group, initial contact reports shall be made per SUWC directives.

c. Low Visibility. When operating during periods of low visibility or when contact density is particularly high, a scope range of less than 20 NM may prove to be optimum and may be directed by the SWO with concurrence of the OOD. When reducing the manual scope range below 20 NM, the ACDS tracker will maintain his 32 NM range scale and become the primary long range surface tracker.

d. Restricted Waters. When operating in restricted waters, the navigation detail will be set. Close coordination between the shipping and piloting officers is required. The shipping officer must keep the piloting officer informed of the location and movement of all surface contacts in order for intelligent navigation recommendations to be made. Based upon the density of surface contacts, the shipping officer must direct the optimum range scale of the surface tracker and determine which contacts are considered to be tactically significant. In order to avoid swamping the bridge with surface contacts while operating under these conditions only significant contacts should be reported. In addition, the piloting officer must keep the shipping officer advised of pending course changes in order to determine which contacts should be tracked.

IV. Navigation

a. General. U.S. Navy Regulations charges CDC with the timely dissemination to the OOD/navigator of all information available in SUWM and TOP which might affect the mission or safety of the ship.

b. Radar Navigation (RADNAV)

(1) The CDC Officer is responsible for the organization of a competent RADNAV team. The RADNAV team will augment the regular underway watch during each sortie and entry into port and while navigating restricted or coastal waters. In the event of low visibility, visual information from the bridge will diminish and increased responsibility will be placed on SUWM/TOP to aid in conducting safe passage. It is essential that the CDCWO and the SWO be prepared to give the OOD and navigator the following:

(a) Timely and accurate recommended course/speed changes.

(b) The position of the ship with respect to the proposed track, shoal water, anchored ships, channel buoys, turning points, shipping and any other hazards to safe navigation.

(c) Determination of set and drift.

(d) Distance and time remaining on each leg of the track.

(e) Timely warning of the approach of other vessels underway and recommendations for their avoidance.

(f) Immediate reports of any circumstances which may necessitate a change in the proposed track, with appropriate recommendations.

(2) The SWO is responsible for ensuring completion of preparations for radar assisted piloting, the manning of the RADNAV team and the coordination between CDC/TOP and the OOD/navigator.

(3) Coordination implies a two-way flow of information between the RADNAV team and the navigator. Just as the SWO and CDCWO are charged with certain duties in the liaison process, so is the OOD/navigator responsible for informing CDC of the following:

(a) Deviation from proposed sortie or entry plan or Plan of Intended Movement (PIM).

(b) Changes of course or speed.

(c) Acknowledgement and acceptance or rejection of the SWO/CDCWO/TAO recommendations.

(d) Concurrence or non-concurrence of position data.

(e) Navigation aids and prominent objects within visual range.

(f) Other information available on the bridge of value to the CDC/TOP such as weather, visibility, fog signals, etc.

c. Coastal Navigation. When conducting coastal piloting, with or without the assistance of the RADNAV team, SUWM/TOP will obtain radar fixes every fifteen minutes. The OOD/navigator will be informed of the status of these fixes. All radar fixes will be logged in the radar navigation log. In addition, the RADNAV position and the navigators position will be logged in the position log and plotted on the chart for comparison at least half-hourly.

d. Open Ocean Navigation. When conducting operations at sea, SUWM/TOP will make every possible attempt to obtain radar fixes anytime land masses are held on radar. When unable to obtain radar fixes due to the distance from land masses, the navigator's hourly position will be logged in the position log for comparison with the GPS, ACDS, DRT, and plotted on the chart. Additional information to be plotted on the chart include:

(1) Ship's track or PIM

(2) Dead reckoned position

(3) Operating area

(4) Hazards to navigation

(5) Friendly and hostile forces of significant interest

(6) Any other information of interest

APPENDIX A

CDC NAVIGATION AND
SURFACE CONTACT MANAGEMENT CHECK OFF LIST

		YES	NO/ RMKS
1.	Organization		
a.	Is the CDC officer designated by letter?		
b.	Is the watchbill signed by the Operations Officer?		
c.	Are the watches fully manned per the SORM, Combat Systems Technical Procedures, and standing orders?		
d.	Compare PQS charts and the Watch, Quarter, a and Station Bill to the watchbill to ensure only qualified personnel were assigned:		
	(1) Special sea and anchor detail.		
	(2) Condition III steaming.		
	(3) During general quarters.		
	(4) During low visibility.		
e.	Are experienced personnel designated to Maintain the logs?		
f.	Are senior and experienced petty officers on the sea detail watchbill, as watch supervisors, to lend maximum professionalism to the training and performance of the watch teams?		
g.	Is a complete file of the following properly maintained?		
	(1) Weekly notice to Mariners?		
	(2) Local notice to Mariners?		
	(3) HYDROPACS/NAVAREA		
	(4) Notice to Mariners and Broadcast Notice to Mariners?		
h.	Are the CDC Chart Petty Officer and assistant(s) formally assigned in writing as Collateral duties?		
i.	Is there a ship's instruction or OPS Department notice regarding maintenance and correction of specific nautical charts and publications which must be maintained up-to-date?		

j.	Is the basic minimum chart and publication allowance on board per current directive?		
k.	Are chart and publication correction record cards prepared for the full allowance of charts and publications and changes made through the latest Notice to Mariners?		
l.	Are corrections properly made?		
m.	Is there an adequate system in force to ensure that all radio message traffic concerning operations and navigation hazards are received by the CDC and Bridge Watch Officers?		
n.	Does the CDC training plan provide for the following:		
	(1) Lookout training; i.e., contacts, target angle, etc.?		
	(2) Low VIS lookout training?		
	(3) Phone talker training?		
	(4) Radar navigation training?		
	(5) Contact management training?		
	(6) Scheduling of all personnel on the CDC and bridge sea detail navigation teams to attend Radar Assisted Piloting Course (J-221-0344)?		
o.	Have the following school courses been completed?		
	(1) Have two Rad Nav Teams completed Radar Assisted Piloting (J-221-0344)?		
p.	Do the standing orders and/or designation letters clearly specify the responsibilities of the Navigator and CDC officer with respect to the management of contact reporting and recommendations for timely maneuvering to avoid risk of collision or grounding by watchstanders under their supervision?		
q.	Do the CDC piloting and shipping teams attend The Navigation brief prior to getting underway or entering port?		
r.	Does the Navigator conduct a debrief of the CDC piloting team after each sea detail, compare the bridge and CDC plots, and analyze fixing data which did not cut?		

2.	Standing Orders and Doctrine		
	a. Are CDC check off lists for entering port and Getting underway formally promulgated and used?		
	b. Do the standing orders define the duties of the TAO, CDCWO, and SWO?		
	(1) Is tracking data maintained on surface Contacts until scrub is authorized by JOOW/JOOD/OOD?		
	(2) Are maneuvering board solutions required for all surface contacts having a CPA within 10K yds?		
	(3) Are all designated contacts correlated by track number with the bridge SPA-25G/ARPA contacts. Are bridge generated CPA's compared with ACDS CPAs to check for obvious inaccuracies?		
	(4) Is there a requirement to correlate all Visual contacts with radar contacts?		
	c. Is ACDS used to assist in determining the Optimum course for avoiding multiple contacts?		
	d. When the ship is designated as SUWC or Alternate SUWC, is the SUWC watch organization separate from the Surface Watch organization even though they may be co-located?		
	(1) Is the SUW C & R net monitored in TOP and SUWM?		
	(2) Do the OOD and CDCWO/TAO receive reports from the SWO when SUWC COIs will pass within reporting distance from the ship?		
	e. During Emission Control conditions (EMCON):		
	(1) Do the standing orders specify who can authorize use of radar for safe navigation and shipping avoidance?		
	(2) Is there a procedure for single sweep tracking?		
	(3) Is there a reporting procedure for passing the bridge's radar (SPS-64) contacts to the CDC Surface Watch for correlation with LINK/JMCIS tracks.		
	(4) Is there a procedure for designating and tracking the lookouts visual contact reports and does CDC plot and track the lookout reports in order to note position and bearing drift?		

3.	Preparation			
	a.	Are the largest scale corrected charts available and used in SUWM and TOP.		
	b.	Do SUWM/TOP and the Bridge have the same charts and tracks? Did the Navigator and CO sign the charts?		
	c.	Are the visual and radar reference points labeled on the charts and logged with latitude and longitude, noun name, and designation?		
	d.	Is the Navigator's tide and current time plot posted?		
	e.	Is radar range and bearing error determined, dated and posted on all radar repeaters? (Compare bridge and surface module repeaters, determine/resolve differences.)		
	f.	Is the ship on internal power at least 12 hours prior to underway, to facilitate electronic equipment calibration?		
	g.	Are the surface radar tuned, repeaters calibrated, and the results logged in underway checklist? (Calibration should include range and bearing calibration on a ship, using fixed position alongside the pier checked to a known point.)		
	h.	Is the ship's tactical data available to SUWM/TOP?		
	i.	Is a member of the watch team designated to Keep the tugs and their make-up plotted?		
	j.	Are communications on the sound-powered circuits and MC units checked and the results logged in the appropriate logs? Are phone stations between CDC and bridge manned by knowledgeable and competent phone talkers?		
	k.	Are clocks synchronized by time check on the 1MC to a common standard prior to getting underway, daily, or before commencing a coordinated piloting evolution; e.g., coastal navigation, sea and anchor detail, etc.?		
	l.	Are the CDC and navigation piloting teams given a navigation brief prior to getting underway or entering port?		

4.	Low Visibility Considerations:		
	a. Is CDC/TOP organized to swiftly transition to a LOWVIS piloting team? (The bridge should be augmented, not replaced, by CDC as the primary LOWVIS Team. The Navigator should function as the evaluator in either normal piloting or LOWVIS situations).		
	b. Are the LOWVIS watchbills published prior to Getting underway to facilitate immediate implementation? Are the LOWVIS watchbills approved by the Operations Officer or Navigator?		
	c. Under conditions of low visibility, did the SWO recommend:		
	(1) Station the low visibility detail?		
	(2) Material condition Zebra to be set main deck and below?		
	(4) Running lights turned on?		
	(5) Ship's whistle sounded to conform to inland or international rules, as appropriate.		
	(6) Slowing to a safe speed (as prescribed by the Navigation Rules)?		
	d. Are all uncorrelated fog signals identified and all risk of collision determined not to exist before the recommendation is made for the ship to proceed on?		
	e. Are the SPS-64 and SPN-43 in standby as a back Up for the SPS-67?		
	f. Are the SPA-25Gs effectively used by the Navigation detail and shipping watch?		
	g. Is SPS-67 short pulse selected? Are other radar set control fixes utilized properly?		
5.	Underway Section A - Radar Navigation		
	a. Were fix points selected to ensure angular separation?		
	b. Did reports after each fix include: (1) Fix reliability. (2) Positional information. (3) Depth of water beneath the keel (agrees/ disagrees with charted depth). (4) Nearest shoal water or navigation hazard (from ship's extremity). (5) Distance to turn/time of turn. (6) Computed set and drift.		

c.	Was set and drift calculated on each leg and used in making recommendations to the conn?		
d.	Before recommending a new course, were shipping contacts considered?		
e.	Was a DR effectively used at all times and Extended to the maximum length appropriate to the circumstances? (As a rule of thumb, the minimum DR should be twice the fix interval.)		
f.	Was radar distortion considered; pulse and band widths considered?		
g.	Was the bridge notified when passing the boundary between inland and international waters and logged?		
h.	Was two-way communication between the navigator's team and CDC/TOP utilized to concur or resolve errors?		
i.	Were the CO and Conning Officer aware of whether the fixes and recommendations from CDC/TOP were in agreement with the Navigator's?		
Section B -	Underway CDC Surface Contact Management:		
a.	Are the communications procedures adequate to Ensure rapid changes of vital information between CDC/CONN?		
b.	Are all contacts designated and logged in the Contact Log while underway?		
c.	As a minimum, is the following contact information determined/recorded: (1) Time. (2) Designation. (3) Range/bearing. (4) Course/speed (and changes thereto). (5) CPA (including time of CPA, bearing, range and changes thereto). (6) Remarks; e.g., identification, maneuvering recommendation, opening, closing, fading, scrubbed, lost. (7) New CPA based on recommended course or speed change at specified time.		
d.	Are contacts tracked and reported per the Command policy directives?		
e.	Are contacts "scrubbed" and "watched" by the authority outlined in command directives?		
f.	Are lookouts relaying contact information to CDC/CONN? Are they coached onto new contacts?		
g.	Are lookout contacts correlated by CDC with radar contacts? Are lookout or radar contacts correlated by CDC with available radio information or other ID methods (E-2C/IFF/ESM, track number)?		

h.	Is the DRT operating? Is the DRT operator proficient in DRT mechanics of operation, symbology and plotting legibility?		
i.	When potentially dangerous situations become discernible, do all watchstanders understand the responsibility to make the facts known to the CONN, including any and all means of communications alternative to the JL circuits?		
j.	Are CDC/TOP watch team leaders intimately familiar with collision regulations (COLREGS) published as Navigation Rules-International-Inland. Was there knowledge of COLREGS demonstrated by the CDC supervisory personnel?		
k.	Is the CDC/TOP Watch required by command Directives to provide the bridge with maneuvering recommendations when risk of collision exists?		
l.	Was known shipping (expected to enter or leave port) listed on the status board?		
m.	Was a low noise level maintained?		
Section C -	CDC Logs and Records		
a.	Did the Radar Navigation Log provide accurate Data for the reconstruction of the CDC radar plot for purposes of the debrief?		
b.	Was the surface contact log properly maintained?		
c.	Was the CDC watch log properly maintained?		
d.	Was the visual bearing/fathometer (JW) log maintained?		
e.	Were radio logs properly maintained?		
f.	Were appropriate instructions posted in each log?		
g.	Are the CO's standing orders readily available to the TAO, CDCWO, and SWO?		
h.	Are the CO's night intentions reviewed by the TAO, CDCWO, and SWO?		